

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended). A method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines, comprising:

- a) providing at least a first optical line and a second optical line;
- b) initializing the first optical line and the second optical line respectively as an operational line and a protection line;
- c) determining optical strength at least in the operational line;
- d) determining performance at least in the operational line and the protection line;

and

- e) designating the first optical line and the second optical line respectively as the protection line and the operational line based upon any combination of the optical strength and the performance of the first optical line and the second optical line; and
- f) storing data on the optical strength and the performance.

Claim 2 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein the performance is determined in both the first optical line and the second optical line.

Claim 3 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein the optical strength is determined in both the first optical line and the second optical line.

Claim 4 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein the performance is determined in the protection line before said designating step e).

Claim 5 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein the optical strength is determined in the protection line before said designating step e).

Claim 6 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein the performance is determined in the operational line after said designating step e).

Claim 7 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein the optical strength is determined in the operational line after said designating step e).

Claim 8 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein the performance is determined in the protection line after said designating step e).

Claim 9 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 8 further comprising:
fg) designating back the first optical line and the second optical line respectively as the operational line and the protection line based upon the performance of the protection line.

Claim 10 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein the optical strength is determined in the protection line after said switching.

Claim 11. The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 10 further comprising:

gh) designating back the first optical line and the second optical line respectively as the operational line and the protection line based upon the optical strength of the protection line.

Claim 12 (cancel).

Claim 13 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim ~~12~~ 1 further comprising:

i) ~~wherein~~ repeating said determining steps c) through said designating step e) in response to a request; and

ij) reporting the stored data.

Claim 14 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein said designating is optical switching between the first optical line and the second optical line.

Claim 15 (currently amended). The method of monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 1 wherein said designating is optical blocking one of the first optical line and the second optical line.

Claim 16 (currently amended). A system for monitoring optical signals in a plurality of optical lines for selecting one of the optical lines, comprising:

at least a first optical line and a second optical line;

an optical line selector for selecting one of the first optical line and the second optical line;

a first control unit connected to said optical line selector for generating a selection signal indicative of selecting the first optical signal and the second optical signal, said

first control unit initializing the selection signal indicative of selecting the first optical line and the second optical line respectively as an operational line and a protection line;

an optical detector connected to at least the operational line for determining optical strength in the operational line; and

an optical line performance monitor unit connected to at least the operational line for determining performance in the operational line, wherein said first control unit further connected to said optical detector and said optical line performance monitor unit for generating the selection signal indicative of the first optical line and the second optical line respectively as the protection line and the operational line based upon any combination of the optical strength and the performance of the first optical line and the second optical line.

Claim 17 (currently amended). The system for monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 16 wherein an independent one of said optical line performance monitor unit is connected to both the first optical line and the second optical line.

Claim 18 (currently amended). The system for monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 17 wherein an independent one of said optical detector is connected to both the first optical line and the second optical line.

Claim 19 (currently amended). The system for monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 18 further comprising a second control unit connected to said first control unit for initiating the generation of the selection signal.

Claim 20 (currently amended). The system for monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 19 wherein said first

control unit in response to said second control unit generates the selection signal indicative of the first optical line and the second optical line respectively as the protection line and the operational line and subsequently also generates the selection signal indicative of the first optical line and the second optical line respectively as the operational line and the protection line.

Claim 21 (currently amended). The system for monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 19 wherein said first control unit in response to said second control unit generates the selection signal indicative of the first optical line and the second optical line respectively as the protection line and the operational line.

Claim 22 (currently amended). The system for monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 18 further comprising a memory unit for storing data on the optical strength and the performance, said first control units reading the stored data from said memory unit to send the stored data to said second control unit.

Claim 23 (currently amended). The system for monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 16 wherein said optical line selector is an optical switch.

Claim 24 (currently amended). The system for monitoring optical signals in a plurality of optical lines for selecting one of the optical lines according to claim 16 wherein said optical line selector is an optical blocking device.

Claim 25 (currently amended). An optical line selector package for selecting one of a plurality of optical lines, comprising:

an optical line selector connected to the plurality of input optical lines at an input side as well as at least one output optical line at an output side;

an optical line performance monitor unit connected to the output optical line for monitoring a predetermined set of performance characteristics in the optical lines at the output side of said optical line selector, said optical line performance monitor generating a performance signal indicative of the performance characteristics;

a selector control unit connected to said optical line performance monitor unit to generate a selector drive signal at least based upon the performance signal, the selector drive signal being indicative of a current selection of the input optical lines; and

wherein said optical line selector further connected to said selector control unit for selecting one of the input optical lines based upon the selector drive signal.

Claim 26 (original). The optical line selector package for selecting one of a plurality of optical lines according to claim 25 further comprising:

an optical detector connected to one of the optical lines for detecting optical strength of the optical lines, said optical detector generating an optical strength signal indicative of the optical strength, wherein said selector control unit further connected to said optical detector for generating the selector drive signal based upon both the performance signal and the optical strength signal.

Claim 27 (original). The optical line selector package for selecting one of a plurality of optical lines according to claim 25 further comprising:

a monitor port connected to at least one of the input lines for monitoring the input lines.

Claim 28 (original). The optical line selector package for selecting one of a plurality of optical lines according to claim 25 further comprising:

a monitor port connected to at least one of the output lines for monitoring the output lines.

Claim 29 (original). The optical line selector package for selecting one of a plurality of optical lines according to claim 25 further comprising:

a LED unit connected to said selector control unit for indicating the current selection of the input optical lines.

Claim 30 (new). An optical 1 + 1 switching apparatus, comprising:

a first transmission line output unit connected to a first transmission line for converting a first optical signal on the first transmission line to a first electrical signal and for monitoring first quality in the first transmission line based upon the first electrical signal, said first transmission line output unit converting the first electrical signal back to the first optical signal and outputting the first optical signal;

a second transmission line output unit connected to a second transmission line for converting a second optical signal on the second transmission line to a second electrical signal and for monitoring second quality in the second transmission line based upon the second electrical signal, said second transmission line output unit converting the second electrical signal back to the second optical signal and outputting the second optical signal;

a first optical detection unit connected to the first transmission line for monitoring first strength of the first optical signal;

a second optical detection unit connected to the second transmission line for monitoring second strength of the second optical signal;

an optical switch connected to the first transmission line and the second transmission line for selecting the first optical signal or the second optical signal; and

a control unit connected to said first transmission line output unit, said second transmission line output unit, said first optical detection unit, said second optical detection unit and said optical switch for controlling said optical switch by selecting the first transmission line or the second transmission line based upon the first quality, the second quality, the first strength and the second strength.

Claim 31 (new). An optical 1 + 1 switching apparatus, comprising:

a first transmission line output unit connected to a first transmission line for converting a first optical signal on the first transmission line to a first electrical signal and for determining whether or not the first transmission line is faulty based upon the first electrical signal, in case of being faulty, said first transmission line output unit blocking the first optical signal, in case of being not faulty, said first transmission line output unit converting the first electrical signal back to the first optical signal and outputting the first optical signal;

a second transmission line output unit connected to a second transmission line for converting a second optical signal on the second transmission line to a second electrical signal and for determining whether or not the second transmission line is faulty based upon the second electrical signal, in case of being faulty, said second transmission line output unit blocking the second optical signal, in case of being not faulty, said second transmission line output unit converting the second electrical signal back to the second optical signal and outputting the second optical signal;

a first optical detection unit connected to said first transmission line output unit for monitoring first strength of the first optical signal;

a second optical detection unit connected to said second transmission line output unit for monitoring second strength of the second optical signal;

an optical switch connected to the first transmission line and the second transmission line for selecting the first optical signal or the second optical signal; and

a control unit connected to said first optical detection unit, said second optical detection unit and said optical switch for controlling said optical switch by selecting the first transmission line or the second transmission line based upon the first strength and the second strength.

Claim 32 (new). An optical 1 + 1 switching apparatus, comprising:

a first transmission line output unit connected to a first transmission line for converting a first optical signal on the first transmission line to a first electrical signal and

monitoring first quality based upon the first electrical signal, said first transmission line output unit selecting to block the first optical signal or to convert the first electrical signal back to the first optical signal for outputting the first optical signal;

a second transmission line output unit connected to a second transmission line for converting a second optical signal on the second transmission line to a second electrical signal and monitoring quality based upon the second electrical signal, said second transmission line output unit selecting to block the second optical signal or to convert the second electrical signal back to the second optical signal for outputting the second optical signal;

an optical combiner connected to said first transmission line output unit and said second transmission line output unit for combining the first optical signal and the second optical signal to generate a combined optical signal and outputting the combined optical signal; and

a control unit connected to said first transmission line output unit and said second transmission line output unit for sending said first transmission line output unit a first signal indicative of blocking the first optical signal in case of detecting a faulty condition in the first transmission line based upon the first quality and for sending said second transmission line output unit a second signal indicative of blocking the second optical signal in case of detecting a faulty condition in the second transmission line based upon the second quality.

Claim 33 (new). An optical 1 + 1 switching apparatus, comprising:

a first optical detection unit connected to a first transmission line for monitoring first strength of the first optical signal;

a second optical detection unit connected to a second transmission line for monitoring second strength of the second optical signal;

an optical switch connected to the first transmission line and the second transmission line for selecting the first optical signal or the second optical signal as a selected optical signal based upon a control signal;

a reception signal performance monitoring unit connected to said optical switch for monitoring quality of the selected optical signal; and

a control unit connected to said first optical detection unit, said second optical detection unit and said reception signal performance monitoring unit for generating the control signal based upon the first strength, the second strength and the quality.

Claim 34 (new). The optical 1 + 1 switching apparatus according to claim 33 wherein said control unit further comprises a memory unit for storing the first strength, the second strength and the quality.

Claim 35 (new). An optical 1 + 1 switching apparatus, comprising:

a first optical detection unit connected to a first transmission line for monitoring first strength of the first optical signal;

a second optical detection unit connected to a second transmission line for monitoring second strength of the second optical signal;

an optical switch connected to the first transmission line and the second transmission line for selecting the first optical signal or the second optical signal as a selected optical signal based upon a control signal;

a reception signal performance monitoring unit connected to said optical switch for monitoring quality of the selected optical signal; and

a control unit connected to said first optical detection unit, said second optical detection unit and said reception signal performance monitoring unit for generating the control signal based upon the first strength, the second strength and the quality, said control unit transmitting to said optical switch the control signal indicative of switching, said optical switch switching from the first transmission line to the second transmission line, said reception signal performance monitoring unit transmitting to said control unit the quality of the second transmission line, said control unit transmitting to said optical switch a switch back control signal indicative of switching back from the second transmission line to the first transmission line in response to the quality from said

reception signal performance monitoring unit, said optical switch switching from the second transmission line to the first transmission line as an operational line, wherein said optical 1 + 1 switching apparatus monitors the quality in the second transmission line as a protection circuit for a predetermined amount of time prior to switching to the second transmission line as a working circuit.

Claim 36 (new). An optical 1 + 1 switching apparatus, comprising:

- a first optical detection unit connected to a first transmission line for monitoring first strength of the first optical signal;

- a second optical detection unit connected to a second transmission line for monitoring second strength of the second optical signal;

- an optical switch connected to the first transmission line and the second transmission line for selecting the first optical signal or the second optical signal as a selected optical signal based upon a control signal;

- a reception signal performance monitoring unit connected to said optical switch for monitoring quality of the selected optical signal; and

- a control unit connected to said first optical detection unit, said second optical detection unit and said reception signal performance monitoring unit for generating the control signal based upon the first strength, the second strength and the quality, said reception signal performance monitoring unit or said first optical detection unit transmitting to said control unit an alarm signal in case of a faulty condition in the first transmission line, said control unit transmitting to said optical switch the control signal in response to the alarm signal, said optical switch switching from the first transmission line to the second transmission line in response to the control signal for maintaining transmission of the selected optical signal, wherein said control unit transmits to said optical switch the control signal indicative of switching after a predetermined amount of time, said optical switch switching from the second transmission line to the first transmission line, said reception signal performance monitoring unit transmitting to said control unit the quality of the first transmission line, said control unit transmitting to said

optical switch a switch back control signal indicative of switching back from the first transmission line to the second transmission line in response to the quality from said reception signal performance monitoring unit, said optical switch switching from the first transmission line to the second transmission line as an operational line, wherein said optical 1 + 1 switching apparatus monitors the quality in the first transmission line as a protection circuit for a predetermined amount of time prior to switching to the first transmission line as a working circuit.